LabLink
your connection to Brookhaven Lab's world-class science

Volume I, Issue 2
**September 2011**

## NSLS-II: Newest World-Class Science Facility at Brookhaven Lab

The world-leading capabilities of the National Synchrotron Light Source II (NSLS-II) are essential in order to tackle some of the most important scientific challenges of our time. For example, scientific discoveries at NSLS-II will lead to major advances in alternative energy technologies, such as hydrogen and solar. Scientific breakthroughs in developing new materials with advanced properties could pave the way to:

- catalysts that split water with sunlight for hydrogen production
- materials that can reversibly store large quantities of electricity or hydrogen
- high-temperature superconducting materials that carry electricity with no loss for efficient power transmission lines
- materials for solid-state lighting with half of the present power consumption.

Rendering of the NSLS-II

NSLS-II construction began in 2009 and the facility is scheduled to open in 2015. During its construction and operation, NSLS-II is expected to create more than 1,250 construction jobs and 450 scientific, engineering, and support jobs, plus additional jobs at U.S. material suppliers and service providers.

## X-ray Technique Invented at NSLS: Helps Detail Joint Injuries in Children

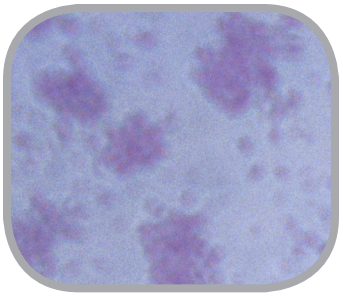
Using an x-ray technique invented at BNL's now-operating National Synchrotron Light Source (NSLS), scientists have learned new information about how children's knee joints are damaged as the result of a compression injury which could happen during sports or play. Their work could help researchers understand how this type of joint injury can progress to secondary osteoarthritis, a painful condition caused by cartilage loss.

The technique is called diffraction enhanced imaging, or DEI. DEI uses extremely bright beams of x-rays to visualize not only bone, but also soft tissue in a way that is not possible using standard x-rays. In contrast to conventional sources, synchrotron x-ray beams are thousands of times more intense and extremely concentrated into a narrow beam. The result is a lower x-ray dose with a higher image quality.

## Happenings

- **October 13 –** BNL Community Advisory Council, 6:30 p.m., Berkner Hall, Room B. Open to the public.
- **October 19 –** BNL Distinguished Lecture, "Space-Time, Quantum Mechanics and the Large Hadron Collider," Nima Arkani-Hamed, Institute for Advance Studies, Princeton, 4 p.m., Berkner Hall Auditorium, free.
- **November 9 –** Noon Recital, Berkner Hall Auditorium, free.

*Visitors 16 and over must bring a photo ID for access to BNL events



E. Coli

## NSLS Research May Lead to New Antibiotics for Women

New atomic-level "snapshots" reveal how bacteria such as E. coli produce and secrete sticky appendages called pili, which help the microbes attach to and infect human bladder cells.

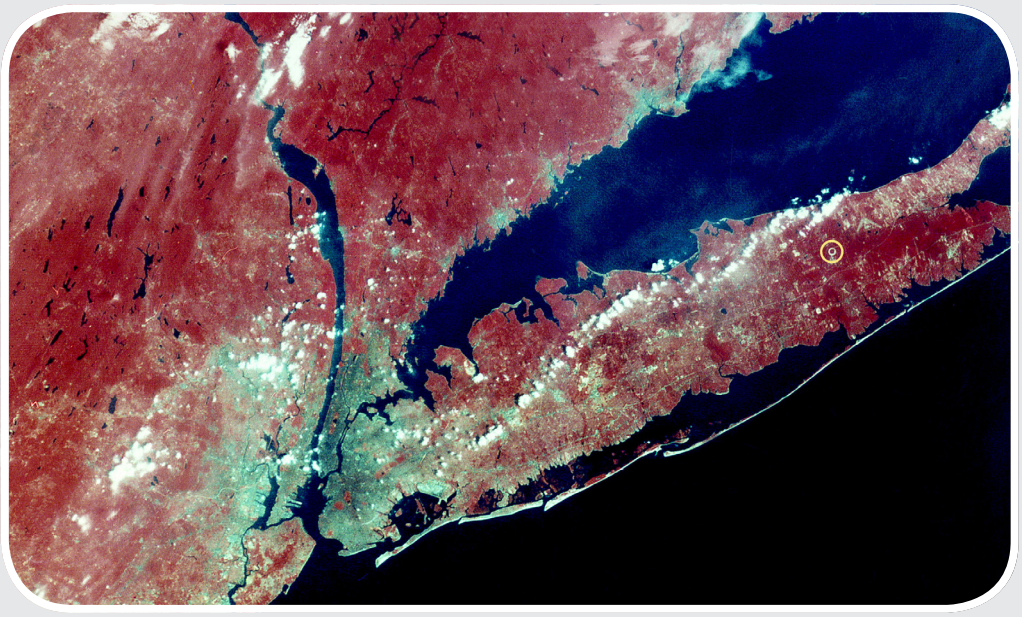
These molecular-level images — produced at our National Synchrotron Light Source and at the European Synchrotron Radiation Facility in Grenoble, France — unravel a complex choreography of protein-protein interactions that will aid in the design of new antibacterial drugs. Finding ways to interfere with pili formation could help thwart urinary tract infections, which affect millions of women around the world each year.

## Brookhaven Lab Drives Long Island Economy

According to a report issued this spring by Appleseed, a Manhattan-based consulting firm, Brookhaven National Laboratory has a significant impact on the economy of Long Island and New York State.

From October 1, 2008 through September 30, 2009, the economic output generated by BNL and its visitors amounted to $704 million, and the Lab created 5,400 jobs throughout New York State—5,190 of them on Long Island. Supporting local and state businesses whenever possible, the Lab also spent $212 million on purchases of goods and services. $75.2 million of this total was spent in New York State including $62.7 million spent on Long Island.

Read the full report online at www.bnl.gov/economic/ or request a print copy by calling (631) 344-3129.



Satellite View of Long Island (circle pinpoints Brookhaven Lab)

Receive LabLink by email

Sign up at
**www.bnl.gov/lablink**

LabLink is a monthly publication from Brookhaven National Lab's Community Relations Office that will keep you informed about happenings at the Laboratory, help you understand some of the science behind our research, and invite you to our many educational and cultural events. To learn more about the Lab visit www.bnl.gov.

BROOKHAVEN NATIONAL LABORATORY

Brookhaven National Laboratory is managed by Brookhaven Science Associates for the U.S. Department of Energy's Office of Science

U.S. DEPARTMENT OF ENERGY